Six Minute Walk Distance: Reference values in healthy Italian children.

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Introduction

The 6-minute walk test (6MWT) is a simple assessment tool to evaluate exercise capacity. The result of the test is the distance that a subject can walk at a constant and normal pace within 6 minutes (6MWD) and reflects walking function at a submaximal level[1]. Use of 6MWT on healthy children has been relevant to assess exercise tolerance[2] and to compare it to pathological conditions[3]. Our aim was to find reference values for the 6MWT in healthy Italian children.

Methods

The 6MWT was performed by 5614 children between 6 and 11 years, following the instructions outlined in the ATS guidelines[1]. Summary statistics are expressed as means and standard deviations or percentages, as appropriate. Age related percentiles (mean±SD of 3rd, 10th, 25th, 50th, 75th, 90th and 97th centiles) of the 6MWD were developed for males and females. Pearson's correlation coefficients were calculated between 6MWD and demographic data. A multiple linear regression model was assessed to predict expected 6MWT performance. All analyses were conducted using STATA/SE, a p value of less than 0.05 was considered significant.

Results

Males walked longer distances than females, respectively 598.8±83.9 m vs 592.1±77.6 m ($p=0.0016$). Values ranged between 513.3±60.4 m for 6 years old children to 656.1±71.6 m for 11. The 50th percentile values resulted in 511 m, 554 m, 603 m, 624 m, 649 m and 670.8 m for boys aged 6 to 11 years old, respectively. Differently the 50th percentile values resulted in 512 m, 543 m, 597 m, 620 m, 643 m and 655 m for girls aged 6 to 11 years old, respectively. A moderate correlation was found between 6MWD and age, weight and height (respectively $rho=0.58$; 0.32; 0.52; $p<0.0001$). In regression analysis, we found that age,

gender and height were positively related to 6MWD, while weight was negatively related with 6MWD [6MWD = 107.91 + 25.02× age (years) +7.52× gender (M) +2.62× height (cm) −2.25× weight (Kg)].

Conclusion

Reference values were established for the 6MWT in Italian healthy children. The 6MWD percentiles according to age provided a useful tool in the assessment of capacity in children aged 6-11 years.

References

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